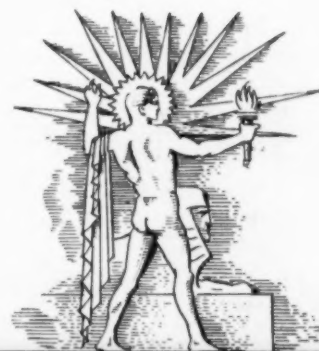
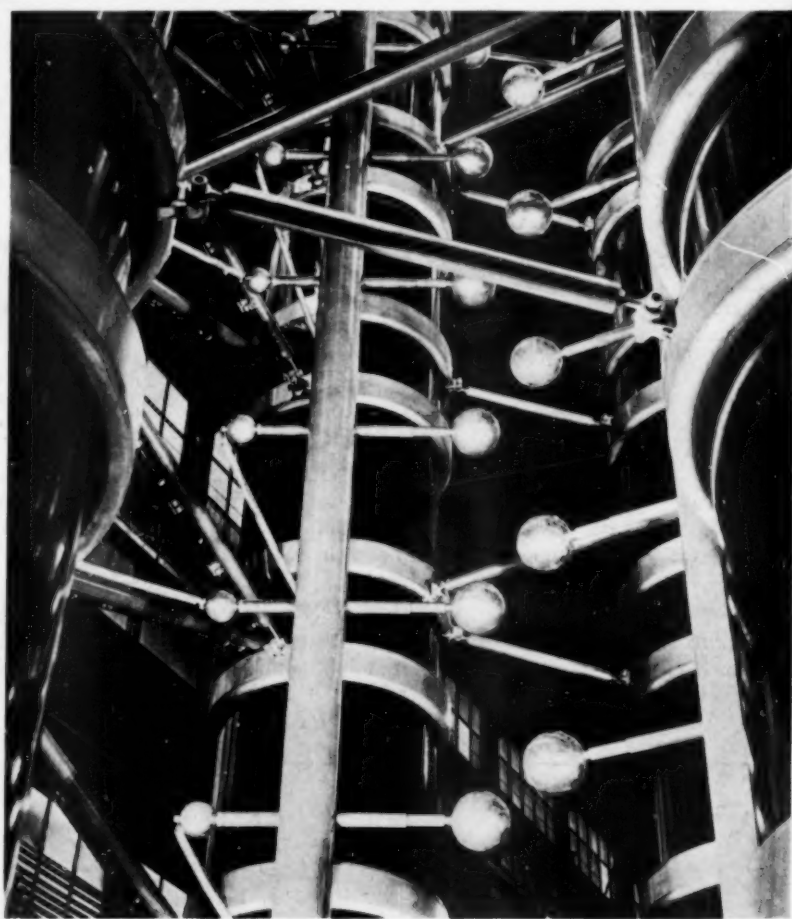


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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



May 13, 1939

Thunder Maker

See Page 302

A SCIENCE SERVICE PUBLICATION

## Do You Know?

Rome has a higher birthrate than any other metropolis in Europe or America—22.4 per thousand.

There is no evidence that human beings in the Old Stone Age made any kind of textiles, says an anthropologist.

Government plant scientists are trying to produce superior strawberry varieties that retain the aroma of wild eastern meadow berries.

A tiny island in a lake—the last known remnant of 23 million acres of public land in Indiana—will be put up for auction in June.

An inscription found in Palestine shows Hebrew characters in the alphabetic order used today—proving that the order has not changed in 2,500 years.

Rubber was brought to the attention of the French Academy of Science in 1736, with reports of how savages used the caoutchouc for boats, boots, and other articles.

In some hospitals, a traveling exhibit of paintings is used, so that a patient may have a picture in his room for a week or so, and then the pictures are shifted in various rooms.

The Bureau of Fisheries comments that the Pilgrims at Plymouth were not good fishermen, but would have had difficulty surviving the first winters without clams, lobsters, and other sea food.

## QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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In what way is father's favorite fortunate? p. 292.

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Why can feeble-minded girls give babies better care than they receive in a poor orphan asylum? p. 300.

### PSYCHOLOGY-SOCIOLOGY

What danger do population experts see in the custom of ignoring new fathers? p. 294.

There are more than 160,000 camels in Tunisia, North African French colony.

A crow can eat a hundred grasshoppers in a meal, and it eats several times a day.

Rich farm soil, well watered, may contain as many as 150,000 earthworms to the acre.

Bighorn sheep are notably sure-footed, but the violent plunge of one that stumbled in flight was recently witnessed.

Showing the strength of piano wire, a piano hanging by a single "A" natural string is exhibited at the New York World's Fair.

A follow-up survey of patients discharged from public tuberculosis sanatoria in 1933, involving 25,000 persons in 16 states, may help explain relapses in this disease.

Finding the date when an immigrant came to America will be quicker, by aid of an index of Ellis Island's records of 18 million immigrants, made by the WPA.

## SCIENCE NEWS LETTER

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## ASTRONOMY

# Aura of Escaping Stars Surrounds Our Galaxy

**New Dimensions of Milky Way Stellar System Given as 80,000 Light Years by Prof. Shapley; Limits Not Sharp**

**A** GIGANTIC aura of escaping, super-speedy stars has been discovered enveloping our own universe of stars, the Milky Way, through the researches of Dr. Harlow Shapley, director of the Harvard Observatory, and his colleagues. This increases the dimensions of our nebula or galaxy to the vast extent of an approximate sphere nearly half a quintillion miles in diameter. That is a chunk of space so large that it takes light some 80,000 years to cross it. Dr. Shapley announced the discovery at McDonald Observatory dedication.

The great aggregation of stars in which our sun is located is seen as the Milky Way in the night sky. Great telescopes, such as the new one going into service on a Texas mountain top, show thousands upon thousands more stars than the eye can see. Most of the stars are located in a relatively thin disc 6,000 light years thick and some ten times as much in diameter. Ninety-nine out of a hundred stars of our galaxy are in this most densely star-populated part of the galaxy.

What is newly discovered is that stars unquestionably belonging to the Milky Way are found far beyond its old limits. These are faint and of high velocity, speeding some 120 miles per second. Dr. Shapley believes that they are the lighter stars that have in effect been thrown out from the main body by gravitational effects. Mathematical physical theory agrees with the actual astronomical finding that this envelope or shell forming this greater galaxy should be a sphere in shape and not a disc like the main mass of the Milky Way.

When inquiring telescopes and photographic plates are pointed at other nebulae or galaxies, such as that in Andromeda, similar star-halo envelopes or shells are found. In some cases the shells of galaxies overlap with those of other, nearby galaxies. The limits of the shell are very indefinite, just as it is difficult to say just where the earth's atmosphere definitely ends.

The two most recently discovered near neighbors in space to our Milky Way,

unusual star aggregations in the constellations of Sculptor and Fornax, have had their distances from us determined by use of famous Cepheid variable stars, whose waxing and waning of light measure the universe for astronomers. They are about 300,000 light years away. Dr. Shapley explained that they are part of our super-galaxy, which roughly includes the volume of space within a million light years of us.

*Science News Letter, May 13, 1939*

## MEDICINE—PHYSICS

## Reddened Faces Mark Step in Medical History

**T**HE world's history is not all being made around European council tables and it is not all being recorded in

state department and foreign office files. Colored pictures of patients with square, reddened areas on their faces, shown at the recent meeting of the American College of Physicians, are records of medical history in the making which may have more far-reaching importance for humanity than the almost daily red-drawings of the map of Europe.

These colored pictures of patients with a square patch of reddened skin are pictures of the first patients treated with science's latest weapon against cancer—neutron rays produced by the atom-smashing cyclotron of the University of California. The pictures were shown to physicians by Prof. E. O. Lawrence, inventor of the cyclotron and director of the radiation laboratory at the University of California where a small group of patients with advanced cancers are now being treated.

It is too early to say whether the treatments are proving cures for cancer, but Prof. Lawrence and the physicians associated with him are hopeful. One reason they are hopeful is connected with those square, reddened patches of skin on the patients' faces. The patches are square merely because the opening from the cyclotron through which come the neutron rays is square. The redness, medically termed erythema, is the skin



### NOT GULLIVER IN LILLIPUT

*Only a skilled craftsman putting the finishing touches on the model of a farm barnyard (date circa 1900) which is part of a farm electrification exhibit at the New York World's Fair.*



reaction to the rays as they pass through to the cancer in the patient's throat.

This same redness is produced by X-rays and, as you know, by the ultraviolet rays of the sun. An important and hopeful difference between X-rays and neutron rays for cancer treatment is in their quality. As an example, Prof. Lawrence explained that physicians cannot safely give much more of an X-ray dosage than will just produce this skin reddening, but considerably more than the skin reddening dosage of neutron rays can be safely given. Perhaps this difference will make all the difference needed for cure of cancer.

*Science News Letter, May 13, 1939*

#### CHEMISTRY

### Plasticized Sulfur Now Serving as Road-Binder

**P**LASTICIZED sulfur, first cousin to the elemental material from which potent industrial chemicals such as sulfuric acid is made, is finding its way into industry as a binder for brick roads, glass skylights and parts of washing machine tubs, as well as in wood to prevent swelling from water, and in other fields.

These new uses are the result of laboratory research conducted at the Mellon Institute in Pittsburgh, the institute, one of the largest industrial research foundations in the world, announced in its annual report, published in *Industrial and Engineering Chemistry*.

The institute spent \$1,104,405 during the year ended last March 1 in furthering research carried out through 86 fellowships, according to the report.

An improved raw material for ceramic products; a superior and safer dry cleaning solvent to replace dangerous explosive "Stoddard solvent"; cheap paper X-ray plates, useful for sorting out tuberculars from healthy people in early diagnosis; and synthetic oils for lubricating watches are among the new products now announced in the report. Discoveries previously reported—such as the promising quinine-derivative treatment for pneumonia and a special treatment for rapid tenderization of meat—are also set forth among the Mellon foundation's accomplishments.

The institute has generally broadened out its work recently, the report points out. "Especially prominent among the institute's recent undertakings has been the inception of researches along a broader front for greater service to science, industry and humanity."

*Science News Letter, May 13, 1939*

#### AERONAUTICS

## New Wing Design Promises 500-Mile-an-Hour Speeds

Product of National Advisory Council for Aeronautics Laboratory at Langley Field Hailed as Major Contribution

**A** NEW TYPE of wing, which makes possible a considerable increase in airplane speeds was announced as the outstanding contribution of the National Advisory Committee for Aeronautics to aviation this year. With other developments, it brings the 500-mile-an-hour airplane within range of the next year or two.

It was developed by a team of half-a-dozen or more staff members of the N.A.C.A. at its Langley Memorial Aeronautical Laboratory during the past year. Worth untold millions to national defense, commercial aviation and private flying, it means not only that high speeds can be gained with the same size of engine, but also that equal speeds are attainable with smaller engines and less fuel—in other words, less money.

Control of the boundary layer of air closest to the skin of the wing, one of the most baffling problems hitherto faced by the science of aerodynamics, has been achieved in the new wing, whose speed-killing and power-consuming drag is thus reduced, Dr. George W. Lewis, the Committee's research director explained.

In conventional wings, the boundary layer close to the leading edge soon becomes turbulent and as a result slows the wing and the entire plane. The transition point between smooth and turbulent air has been moved back on the new wing to a point nearly two-thirds the distance from leading to trailing edge. This is gained by altering the shape of the conventional type of wing, Dr. Lewis said.

No gadgets of any kind are used. At the same time, Venetian blind flaps and some other high lift devices can be adapted for use with it.

No further information concerning the wing, either descriptive or concerning its performance, is available, for it will remain for the time being a closely guarded military secret.

In importance, the conservatively inclined Dr. Lewis rated it with the N.A.C.A. cowling which, ten years ago, added 20 or 25 miles an hour to the speed of every airplane using a radial engine by reducing the drag of the motors' projecting air-cooled cylinders.

*Science News Letter, May 13, 1939*

#### PSYCHOLOGY

## Father's Favorite Child Finds Life Worth Living

**T**HE CHILD who is Father's favorite, whether boy or girl, faces a life worth living, Dr. Ross Stagner, of the University of Akron, told the meeting of the Eastern Psychological Association in Bryn Mawr. But being Mother's favorite does not insure such a happy lot.

Intimate revelations from more than 150 boys and girls aged 18 to 25, collected for Dr. Stagner by Dr. Maurice Krout, of Chicago City Junior Colleges, showed how parents mold the personality of youth.

Girls who are Father's favorite daydream often. Boys who are Mother's favorite are forgetful.

When Father prefers a son, the sister is likely to have feelings of suffocation. When Mother prefers a son, however, sister is suspicious of others.

Boys whose fathers prefer a daughter believe they have enemies. Boys, so rejected by their mothers, may report an unreasoning impulsion to take things.

Boys whose fathers are distant toward them may have thoughts of suicide; if their mothers are distant, they are more likely to develop neurotic pains and dizzy spells.

Girls kept distant by their fathers often report feelings of suffocation, dizzy spells and headaches. Kept distant by

their mothers, they have difficulty in expressing affection, have a feeling of unpardonable sin, and are careful with their language. They may also have an impulse to take things and think of suicide.

Boys should want to emulate their fathers, but not their mothers, this inquiry seems to indicate. Boys who want to be like father have few worries, few feelings of remorse and no thoughts of suicide.

If they want to be like mother, they

are likely to be remorseful, have dizzy spells and forgetfulness, and to think they have enemies.

Girls can want to emulate father, however. They have no headaches or dizzy spells, and they are conservative, they claim, with money. If they want to be like mother, they are affectionate and get along well with the boys, but they may be forgetful and believe they have enemies.

*Science News Letter, May 13, 1939*

PHYSICS—PSYCHOLOGY

## Alcohol Quicker Pain Killer Than Any Drug, Even Morphine

### Physics Experiments Giving Definite Quantitative Results Show That One Aspirin Is as Good as Six

**A**LCOHOL is a quicker pain-killer than any drug, even morphine, and six aspirin tablets are no better than one, it has been found in studies on the human body's tolerance to pain reported to the meeting of the American Physical Society.

Describing the first exact physical measurements on the threshold of pain in the human body, Drs. J. D. Hardy, H. G. Wolff and H. Goodell of the Russell Sage Institute of Pathology, Cornell University Medical College, New York, said that the pain produced over a large area of the body is no greater than is the pain produced over a small area.

Thus there is no summation of pain as there is with the sense of touch, sight or the body's detection of heat and cold.

"This finding," Dr. Hardy declared, "may represent a wise provision of nature which wants the body to be very sensitive to heat but which warns the body as much for the destructive stimulus on a small area as on a large one."

By injection of drugs it was found the total effect obtained by aspirin is secured after the first tablet is taken. Six tablets do no better.

Rating intolerable pain as 100 per cent., the scientists reported aspirin's relative effectiveness as 35 per cent. At the same time they found that injections of alcohol rated 40 per cent. And they found that the alcohol acted within 15 minutes instead of hours required by other drugs.

To fool the test subjects dummy injections were sometimes given. It was possible, with these, to demonstrate the

psychological effect of will-power on deadening pain.

One pain was found to deaden another. A tight clamping of the arm to produce pain dulled pain produced on the forehead by radiation. This is a scientific demonstration of the well-known habit of biting the lips when pain is experienced elsewhere.

Morphine, the master pain-killer, was found to act on the brain and to create pain tolerance all over the body in equal amounts. This finding means that morphine sufficient to dull pain from one tooth extraction would be equally good if two or three teeth were all pulled at once.

To produce pain without heating or by contact the Russell Sage scientists used radiation from a brilliant 1,000-watt electric light whose rays were focussed on the blackened foreheads of the subjects under test.

A shutter exposed the forehead for short intervals which were gradually lengthened until a sensation of pain was just detected at the end of the exposure. At this point a sensitive thermocouple was used to measure the amount of radiation present. By these measurements a threshold of pain could be calculated.

To show that they were measuring only pain and not severe heating, the scientists gave the subjects aspirin to raise the pain threshold (give greater tolerance to pain before the ability to detect it.) It was then found that the pain threshold went up but the heat threshold went down. This indicates that pain, alone, was being measured.



**TWO LARGEST**

*Installed within the bob of the world's largest pendulum is the world's largest hourglass, in which the finely crushed shells of 2,000 eggs are used instead of the much heavier sand. The pendulum itself, a part of the Westinghouse exhibit at the New York World's Fair, requires 30 minutes to swing its full arc of 60 degrees. The bob weighs half a ton.*

Varying areas of the forehead were exposed to the radiation and the pain threshold remained the same. This means that the pain sensation in the body is not an additive one.

Studies of the time it took various amounts of radiation to produce pain showed that not only was the amount of temperature rise important but also the rate of rise of temperature.

Thus the scientists were able to produce severe sensations of pain with only a two-degree rise in the skin temperature if they made this rise occur fast enough. In contrast a slow rise in skin temperature produced only minor sensations of pain until much higher skin temperatures were attained.

## New Evidence of Neutrino

**L**IKE detectives hunting a ghost, scientists have been searching for the neutrino—a hypothetical, elusive atomic particle, long-sought but never found.

At the meeting of the American Physical Society, University of Michigan researchers reported that the search is "warm." Still missing—and perhaps ever to remain so—is the neutrino itself, but

new experiments can at least show the effects of this tiny ghostly particle.

As a "ghost" the neutrino is no malevolent entity. Rather it serves lawabiding physicists in their studies of nature and helps them to avoid breaking the laws of the conservation of momentum in interpreting their atom-smashing experiments.

Drs. H. R. Crane and J. Halpern of the University of Michigan described one such experiment that would controvert the momentum laws unless the neutrino is present.

The scientists studied the spontaneous disintegration of the element chlorine having atomic mass 38. Visible in their apparatus was the track of the electron emitted by the atom in the disintegration and also the track of the recoiling atom.

On an atomic scale the experiment is somewhat like a man standing on a slippery sheet of ice holding in his hand a heavy ball. As he throws out the ball (corresponding to the emission of the electron) he slips backward a bit (the recoil of the atom).

The laws of the conservation of momentum can be used to calculate the energies and momenta for the man and the ball. But for the case of the chlorine the laws and experiment are not in agreement. There is a loss of momentum in the process which does not show up in the experiment.

Scientists can either throw overboard their time-tried law of momentum conservation or they can postulate the existence of a neutrino particle. Naturally they choose the latter alternative.

The neutrino particle, as postulated, has the mass of the electron but is without an electrical charge which makes it non-ionizing (undetectable) as it passes through the instruments.

The new work of Drs. Crane and Halpern is accurate enough so that they can calculate the direction in which the neutrino particle must come off.

## Detects Minute Current

**T**HE MOST sensitive current-detecting device ever developed by science was also described to the Society. Dr. James S. Allen of the University of Minnesota told of a vacuum tube which will measure the minute amount of electricity carried by a single electron passing down a wire every five minutes. This corresponds to a current of 0.000,000,000,000,000,000,001 amperes. The best previous current detector measures, in comparison, 20 electrons a second. Thus the field of sensitivity has been pushed back 6,000 times by the new device.

The two-inch diameter vacuum tube—a modern Aladdin's lamp—is the product of research in television, Dr. Allen indicated.

Standing eight inches tall, it contains a number of beryllium-covered plates arranged much like steps of a ladder. A single atomic bullet falling on the first step knocks out about ten electrons. These secondary electrons speed toward the second step and each one of them knocks out about ten more, and so on for each "step."

The tube is extremely useful in atomic bombardment researches with weak energies. Previously it was necessary for the atomic fragment to tear off electrons from several thousand atoms in its path to make a current that could be recorded. Now the fragment needs to have only the energy to reach the first beryllium step in the tube.

It is possible to attach the new tube directly to a larger vacuum chamber in which atomic disintegrations are occurring so that the fragments come to the first stage of the tube without passing through intervening matter as is the case with the Geiger counter tubes, commonly used for this type of research.

## Thin Film Reflections

**P**ROGRESS in the art of depositing thin films on glass to change the original reflection characteristics was reported by Drs. C. Hawley Cartwright and A. Francis Turner of Massachusetts Institute of Technology.

While originally the M.I.T. scientists described ways of producing almost a complete absence of reflection from glass surfaces by the use of films, their new findings show ways to produce extra high reflections. They do this by depositing alternate layers of materials having high and low indices of refraction.

With such a system they are able to increase the reflecting power by 80 per cent. for any pre-selected wavelength of light.

By choosing film thicknesses suitably they have developed a color filter which will reflect 85 per cent. of the green light and transmit 90 per cent. of the red.

## Lightning Speed Found

**N**EW discoveries showing that lightning strokes travel at 1,000,000,000 centimeters a second (at a rate of more than 22,000,000 miles an hour) were described by J. M. Meek of the University of California.

Initial act of a lightning discharge is

to create a "pilot" streamer of comparatively low velocity which, nevertheless, speeds along at 20,000,000 centimeters a second. The electrical current in this pilot streamer, the California physicist indicated, is about one-tenth of an ampere. Diameter of the streamer is about one-eighth of an inch.

In a cubic centimeter of its "tip" there are 100,000,000,000 ions present, it is estimated.

The later discharge, known as the step leader, has the much higher velocity of 1,000,000,000 centimeters a second.

*Science News Letter, May 13, 1939*

PSYCHOLOGY—SOCIOLOGY

## Keeping Father From Baby May Make Families Small

**S**HUTTING out anxious fathers from the nursery of their newborn babies may be a significant factor in reducing the birthrate, physicians of the New York Academy of Medicine learned from Frederick Osborn, research associate in anthropology of the American Museum of Natural History.

"Students of population increasingly suspect," said Mr. Osborn, "that the attitude of the father often determines ultimate size of family. Does the doctor have this in mind, and do everything possible to bring the father into an intimate relation with the thrilling and beautiful aspects of bringing a new life into the world? Or is the father excluded at the start, and then brought to think of this only as a period of anxiety and painful separation?"

European peoples appear headed for a serious decline following a period of unprecedented numerical increase, Mr. Osborn told the physicians.

Between 1650 and 1933, peoples of European descent increased their numbers sevenfold from 100,000,000 to 700,000,000 while the human race as a whole increased fourfold from 500,000,000 to something over 2,000,000,000.

During this time, however, unnoticed forces were working toward a reversal of the trends. For a hundred years births per married woman had declined.

The physician's advice to parents and his attitude in the matter of family size may be influential in preventing further limitation of families of competent persons, Mr. Osborn indicated.

"The sterility of those who are most affected by the modern civilization in this country and abroad is not a physiological sterility," he said. "It is an emotional sterility, of which birth control is only the tool."

*Science News Letter, May 13, 1939*



## MEDICINE

# Artificial Hibernation Aids Treatment of Human Cancers

Applied Locally, Refrigeration Treatment Lowers Body Temperature Below Critical Point for Cancer Cells

**R**EFRIGERATION, involving "artificial hibernation," is a helpful aid in the treatment of human cancer, Dr. Lawrence W. Smith, of Temple University School of Medicine, Philadelphia, told the American Association for Cancer Research, meeting in Richmond. But it is by no means a cure.

This low temperature "cold" treatment tried on more than 30 cases of inoperable cancer, Dr. Smith reported, gave these results:

Prompt reduction in pain; reduction in size of the local lesion; general improvement in the patient's condition; tendency toward healing of ulcerative and fistulous lesions; and a retardation in recurrences and in the rate of growth of such recurrent lesions.

The refrigeration treatment is applied locally directly to the cancer, or the temperature throughout the body generally is reduced by "artificial hibernation."

The treatment is based on evidence that temperature is an important factor in the activation of embryonic cell

growth and that there are very definitely "critical" levels of temperature which have a much narrower range for young cells like cancer cells than for adult differentiated cells.

Dr. Smith suggests that refrigeration treatment should be made a definite part of cancer treatment, not as a cure in itself but as an adjunct to X-ray treatment and surgery.

## Chemistry Prevents Cancer

**R**ABBITS are better chemists than rats or white mice and consequently can defend themselves against the cancer-causing chemical from coal tar, dibenzanthracene.

Whether human bodies have the same type of chemical defense against this cancer-causing chemical is not yet known, Dr. C. P. Rhoads, of the Hospital of the Rockefeller Institute, New York, who reported the animal studies, declared.

Rabbits are not susceptible to cancer caused by the chemical, Dr. Rhoads explained, whereas rats are somewhat susceptible and mice exceedingly so. All three species, he has found, can convert the chemical into another compound which is not cancer-causing. This may be the mechanism by which the animal protects itself against the chemical production of cancer. But rabbits, Dr. Rhoads found, do a very much better job of chemical conversion of the can-

cer-causing chemical into the harmless one, which accounts for their not being susceptible to cancer from this cause.

The cancer-causing chemical is related to bile salts and sex hormones normally found in human as well as other animal bodies. There has been a theory based on this chemical relationship, that a failure in body chemistry may be a cause of cancer in some cases. Dr. Rhoads' studies seem to throw new light on this aspect of the cancer problem, but it will probably be some time before human applications can be made.

## Cure Shown by Tissue

**A**N IMPORTANT advance in the fight to cure cancer appeared in the report of Dr. Shields Warren, of the Pondville, Mass., State Hospital for Cancer.

Dr. Warren told how physicians can tell whether a course of X-ray or radium treatment for cancer really has cured the condition or whether the patient needs further treatments or perhaps a surgical operation.

A bit of tissue is removed after the last radiation treatment. By looking at a paper-thin slice of this under the microscope the pathologist can tell what effect the radiation had on the cancer cells. If there has been little or no effect, Dr. Warren advises, the treatment should be changed, preferably to surgical procedures.

In a group of 70 cases of cancer of the uterus, all but one of the cured cases, Dr. Warren reported, showed a definite radiation reaction of the tumor cells. On the other hand, 90 per cent. of the group without evidence of radiation reaction died, whereas 64 per cent. of those showing moderate reaction and 58 per cent of those showing a marked reaction died.

*Science News Letter, May 13, 1939*

## TURNING EVIL TO GOOD

*A deep gully was eating into a Nebraska farm, threatening the highway. Under U. S. Soil Conservation Service direction, an earth dam was thrown across it—and now the farmer has a new asset in the form of a well-filled pond, that will furnish water for his stock, and a place for the boys and girls to skate in winter.*



## ENTOMOLOGY

**Pasture Rights Denied To Bees—Not "Livestock"**

**B**EES ARE domesticated insects and insects belong to the animal kingdom, yet bees are not domestic animals within the purposes of the Taylor Grazing Act, it appears from a decision handed down by Commissioner Fred W. Johnson.

Three beekeepers near San Diego, Calif., applied for lease of more than 400 acres of public land for the support of 500 colonies of bees. But their application was turned down as not "coming within the intent and meaning of grazing leases authorized" under the Act.

In the meantime the bees are at large among the white sage, wild lilac, and other fragrant honey plants of the San Diego County foothills—presumably illegally. Fences mean even less to them than they do to goats. It isn't at all practicable to put them in the public pound.

Probably the bees will continue to ignore the law, and the officers of the law will continue to ignore the bees.

*Science News Letter, May 13, 1939*

## PUBLIC HEALTH

**Searching For TB in Apparently Healthy**

**T**HE IDEA that children and young women need to be carefully watched for signs of incipient tuberculosis has been pretty well publicized. But the fight against the great white plague cannot be won by paying attention only to these groups.

Middle-aged men and old people, especially men over 60 years of age, constitute a danger zone, as do certain other special groups. The National Tuberculosis Association, which is waging an early-diagnosis campaign during the month of April, points out that between the ages of 30 and 45 tuberculosis kills more men than women. These are the years when men are anxious to get ahead in life, to hold their jobs and when many of them have the responsibility of supporting a family. So they are likely to disregard the subtle warning signs of oncoming sickness, even if they know that an early diagnosis and early treatment give them a much better chance for cure.

Older persons are likely to escape suspicion of having tuberculosis because of their age. Bronchitis, asthma, sinusitis and heart disease may be disguising their tuberculosis. Even if these persons are not in the class of early cases,

it is important to find them and start treatment both for their own sakes and because they are among the worst spreaders of the disease.

Curing individual patients and preventing them from unwittingly spreading the disease are twin objectives in the fight against tuberculosis. Both of these objectives can best be achieved by finding the disease in its earliest stages. The tuberculin test and the chest X-ray are modern aids in the search. While it is impracticable to apply these searching methods to the entire population, much can be accomplished, it is believed, by applying them among the groups where tuberculosis is especially likely to be making hidden inroads.

*Science News Letter, May 13, 1939*

## PHYSIOLOGY

**Identical Twins Sought To Aid Study of Deafness**

**I**DENTICAL twins who are hard of hearing and willing to help solve the mystery of progressive deafness, are sought by Dr. Edmund Prince Fowler, President of the American Society for the Hard of Hearing.

Dr. Fowler believes that environment is usually more important than heredity in causing progressive deafness. He is eager to obtain facts about many pairs of identical twins with some experience with loss of hearing. If many pairs of such twins have different experiences with hearing loss, it may lead to tracing a cause of the malady in environmental factors. This would be encouraging for physicians, as they may then learn to prevent development of the insidious hearing loss.

A number of such twins have been examined, but many more are needed for a convincing study. Since there are believed to be fifteen million hard of hearing persons in the United States, and thousands of identical twins, the chance of finding enough cases of twins, one or both of whom have hearing defects, is considered good.

Identical twins are always of the same sex and have close physical resemblance. Such twins start life with the same hereditary background, and therefore offer a scientific basis for testing problems of heredity versus environment.

Twins who wish to volunteer can address: American Society for the Hard of Hearing, Volta Bureau, Washington, D. C., or Dr. E. P. Fowler, American Otological Society, 2 East 103rd Street, New York City.

*Science News Letter, May 13, 1939*

**IN SCIENCE**

## CHEMISTRY

**Lignin Found Efficient In Removing Iron From Water**

**L**IGNIN, waste wood product in paper-pulp making, has had another addition made to its growing list of possible uses by chemists of the U. S. Department of Agriculture, at the Agricultural By-Products Laboratory. They have found it to be much more efficient than chemicals now in use for the removal of iron from water.

Iron is a problem in most city and industrial water supplies. Lignin is a problem in the wood-products industries. Put the two together and they solve each other.

Lignin is very cheap because of its great abundance, and the little use hitherto found for it. Yet cheap as it is, it can be used with still further economy in the iron-removal process, because it can be used over and over again, as often as ten times, with no appreciable lessening of efficiency. A compound now in use was tried out in parallel tests by the chemists here, and found not only to remove less iron at any one time but also to lose its efficiency after only six runs.

*Science News Letter, May 13, 1939*

## MEDICINE

**Symptoms Like Leukemia's Induced By Injection**

**S**YMPTOMS like those of leukemia ("blood cancer") were induced in guinea pigs by the injection of a body fluid, lymph, from a dog, Dr. Tom Dougherty of the University of Oklahoma School of Medicine told the American Association of Anatomists. Excessive numbers of certain types of white blood corpuscles were formed, while many red blood corpuscles were destroyed, and damage was done to liver, lungs, kidneys and other internal organs.

Leukemia is one of the worst diseases of the cancer clan, and its cause is still unknown. Dr. Dougherty's studies are directed toward making at least the beginning of a rent in the veil of our lack of knowledge.

*Science News Letter, May 13, 1939*



# THE FIELDS

## MEDICINE

### Sulfanilamide Saves Lives Of Dogs With Brain Disease

**S**ULFANILAMIDE is making dogs healthier. The same chemical which has been used extensively in successful treatment of more than 14 human diseases has saved dogs doomed to death from a disease that is a combination of so-called sleeping sickness and meningitis.

Drs. M. L. Morris and T. J. Murray of the Raritan, N. J., Hospital for Animals and Rutgers University respectively, report (*Science*, March 24) here that 13 out of 14 dogs suffering from meningo-encephalitis associated with canine distemper recovered completely following sulfanilamide treatment. Whereas meningo-encephalitis associated with canine distemper in the past has been 100 per cent fatal, it can now be classed as 93 per cent curable. Sulfanilamide has little value, however, in the treatment of distemper alone, Drs. Morris and Murray point out.

Meningo-encephalitis is an inflammation of the brain and the membranes covering it. It afflicts humans as well as dogs. The specific cause of the condition associated with canine distemper in dogs is not known. Distemper is generally considered the canine counterpart of human influenza.

*Science News Letter, May 13, 1939*

## MEDICINE

### 600,000 Diabetics Are Health Asset To Nation

**D**IABETES has not usually been considered anything like an asset. To the individual who must watch his diet closely, take insulin regularly and take special pains to avoid illness, the complaint certainly seems a liability.

The 600,000 diabetic patients in the United States are, however, a great asset to the country, Dr. Elliott P. Joslin, of New England Deaconess Hospital, Boston, recently pointed out. These patients, he said, represent an army of health officers who serve without pay and whose tenure of office is not endangered by politics.

These persons are truly health officers, in Dr. Joslin's opinion, because they know the health advantages of proper diet, of cleanliness (the diabetic must be constantly on guard against germs, fighting them with scrupulous personal cleanliness) and of regular exercise, and they are being taught more than any other group the value of eugenics. If diabetes is on both sides of the house, the offspring are likely to have the disease. Young diabetics at Dr. Joslin's clinic are taught to marry non-diabetics. Probably one in every four persons in the United States has a diabetic heredity, Dr. Joslin estimates.

The army of diabetics can serve as health officers by watching over their own families. It is up to them, Dr. Joslin says, to detect diabetes early among their relatives, and to keep their relatives from being fat, because fat people are more likely to have diabetes than thin or average weight persons.

The diabetics must also act as health officers to themselves, living an honest diabetic day, and guarding against complications of the disease. Coma and gangrene are among the most serious such complications of diabetes. If the diabetic gets complications by breaking diet or careless living, he not only hurts himself but injures the reputation of the 599,999 other diabetics in the United States and lessens the help the whole army of diabetic health officers can give to the health of the nation.

*Science News Letter, May 13, 1939*

## ZOOLOGY

### New Name-Book Edition Prepared for Zoologists

**A**LL BEASTS of the field and every fowl of the air were passed in review before Adam, "and whatsoever Adam called every living creature, that was the name thereof."

It was as simple as that, in the Garden of Eden. But zoologists nowadays have to remember names in the wrinkles of their brows, if not the sweat thereof. A quarter of a million separate names of animal genera and subgenera will fill the massive new edition of the scientists' book, *Nomenclator Zoologicus*, now a-making in London, under the direction of Dr. S. A. Neave.

The work will comprise four thick volumes when finished, and will contain all generic names proposed between 1758 and the end of 1935. The first volume is due some time next summer, and the others at intervals of about six months.

*Science News Letter, May 13, 1939*

## ENGINEERING

### Standard Concrete Parts Now Being Manufactured

**N**ATION-WIDE manufacture of standardized prefabricated concrete units, produced by newly patented principles of manufacture which assure lower cost fireproof construction, has been launched with the formation of the Cemenstone Corporation in Pittsburgh.

It brings nearer systematic use of prefabricated low-cost housing units. The D. J. Kennedy Company, Pittsburgh, is the corporation's first licensee. The company already is producing its newly patented products.

W. P. Witherow of the Witherow Steel Corporation and president of Blaw-Knox Company, is chairman of the Cemenstone Board. Leslie M. Johnston, former vice-president of the A. M. Byers Company, is president of the organization and Albert Henderson, a nationally known construction supervisor, is consulting engineer.

The Cemenstone Corporation will not itself manufacture precast concrete products directly; instead, it will supply its patented equipment to licensees in designated areas of the nation, who will be granted exclusive rights to manufacture, under the corporation's patents and its trademark, "Cemenstone." It is guaranteed that the products will be made according to the corporation's standards of quality.

This widespread regional production program will enable architects, contractors and building owners to obtain products of known quality and utilization, the corporation asserts.

To emphasize the important steps in construction marked by the newly patented products, Mr. Johnston said:

"In the past concrete products have suffered through lack of standardization, not only as to sizes of units, but also as to comparative appearance, weather-ability and strength. This situation has resulted in limited applications and in varying degrees of acceptance, according to the quality of the products offered in a given community.

"Moreover, in the past production costs were too high, because manufacturers of precast concrete products were compelled to purchase a separate piece of equipment to make each specific product.

"The Cemenstone's newly patented system of concrete production remedies the evils of the past inasmuch as every type of concrete unit now can be produced with the same general equipment."

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PSYCHIATRY

# Subconscious Sabotage

## Hidden Hates Cost Fortunes in Business, Cause Accidents And Sickness; Set Business and Government at Loggerheads

By MARJORIE VAN DE WATER

**A**NY BOSS knows what to do with the impudent boy who flies off the handle and calls him a fat-headed fool.

But what can he do with the employee whose antagonism is hidden behind a respectful front? How is he to handle the office boy who habitually oversleeps and comes to work late? Or the plant worker who faints at her machine? How can he dispose of the machinist who cripples the shop with a well-timed accident? What can he do with the typist who inadvertently sends the check to the delinquent customer and the dun to the promising prospect? And the clerks who sit half the day nursing slights from fellow workers?

These psychopathic sit-downs occur where the workers hate the boss. Students of the human mind recognize them as symptoms of unrecognized antagonisms, eating the souls of persons who are much too well-behaved to "cuss" the boss or throw a brick at him, but who manage despite their best intentions to show their resentment just the same.

The annual expense to business of such repressed hates is staggering. Like a hidden abrasive in the machinery of industry, they wear down the expensive and delicate human element, taking their toll in personal friction, lost time, illness, inefficiency and waste.

Most extravagant of all the "hate losses" is that due to the repressed antagonisms of the boss himself. These lead to errors of judgment, repelling of important contacts, destruction of morale of workers, and the generation of thousands of answering hatreds in the breasts of those with whom he has dealings. Such a situation is quick to put any business on the rocks.

### Start in Childhood

It is back in childhood that such unreasoning and unrecognized hates get their start. How they originate is told by Dr. Ernest E. Hadley of the Washington School of Psychiatry, and editor of the *Journal, Psychiatry*.

Lives of all children necessarily hold a certain amount of disappointment, thwarting, and frustration. Parents rea-

lize that the child's future depends upon his learning to follow the prohibitions required by the community of which he is a part.

"Go see what Johnny is doing and tell him to stop it!" a mother told her older daughter, and this is a picture of much of the usual child training. "No" is often the first word learned by the baby.

The way in which the disappointments and thwartings are thrust on the child and the way in which he receives them may modify his whole later personality, Dr. Hadley has found.

He tells the story this way:

Suppose little Willie comes in from play to find his mother arranging a dish of fruit. He wants an orange. Mother refuses.

Two courses are now open for Willie, and his choice may depend upon the manner used by mother in her refusal. He may set up a lusty howl of disappointment and grief and then, with the cry over, start after something else which may this time be permitted.

### May Be Worried

If Willie is less fortunate, his disappointment may change to apprehension. He is worried. Mother doesn't love him any more. Maybe she wants to starve him. He is frightened and then enraged.

He throws himself on the floor and screams. Little Willie is having a tantrum. Mother is upset. She may relent and offer the orange to him with a "Here, take it if you are going to act that way!" Little Willie, however, now refuses the orange and denies that he wanted one in the first place. He angrily strikes the orange from her hand.

Despite all this, little Willie cannot long continue in his tantrum without developing a sense of insecurity. Even though Mother may increase his hostile reactions with a hair-brush. In the end his need for security and approval force him into being "good." He stops his outward hostility although inside he may still be sore. He may be restless or whiny. He may be ill.

But he feels no desire for an orange. Not only does he not want an orange but also it makes him sick. Perhaps ul-

timately little Willie becomes a person whom the thought of any fruit makes "deathly sick."

Thus, says Dr. Hadley, are formed the hidden hates which so interfere with business life as well as the neurotic dislikes and peculiarities of the finicky faddist.

In childhood also are built the business failures—the lazy, the ne'er-do-wells, the chronic recruits for the unemployment army.

### Success Succeeds

Nothing succeeds like success in child life, as well as in business. If a boy is permitted to go after what he wants, work for it, and get it, he builds confidence. But when little Bobby is told he cannot do this and must not nose into that, curiosity is dulled, enterprise quenched, and courage deadened. Bobby becomes a good little boy or "mama's precious lamb"—with every prospect of being a complete failure in business.

The good little boy makes little trouble in the home and so is an ideal child from the point of view of a busy mother. But among other children he has rough going. His cruel treatment at the hands of the unsuppressed neighborhood brats may add bitterness to his own frustration and write the role of agitator into his future destiny.

Later Bobby may find that what he cannot get by the direct methods of aggression, he may obtain by a shrewd wit, by shading the rules of the game, and by cheating and deception. Then is born the crooked business man, the shyster, the quack, the swindler.

Do you know a man who would walk a mile to return a dollar taken by mistake in making change, but who consistently cheats on his income tax return and pads his firm expense account? Such a man with come-and-go honesty is described by Dr. Hadley.

Mr. B. remembers parents who were so wrapped up in each other and their own selfish interests that they paid no attention to him. They seemed to lavish attention and affection on each other while he, as a child, remained starved outside the circle of their love.

Mr. B. does not realize that he now sees in the "parent organization," "vested interests," "big business," and "the government" a parallel to his own parents. Yet, unconsciously, in defrauding



the government or cheating the street-car company, Mr. B. gains his revenge and salvages something of his boyhood's "rightful due." He early learned to make his own way, and so as an adult is independent but honest in personal dealings.

The unwanted child is headed for almost certain trouble in the years ahead. Prisons and reform schools are filled with boys and men who look back on the cruelty of a resentful father and the impatience of an unwilling mother.

In the case of Mr. C, however, related by Dr. Hadley, incompetence rather than crime was the form of revenge adopted by the rejected child.

The parents of Mr. C. had attempted to salve their conscience by being spuriously over-affectionate. The falseness of this was sensed intuitively by their "spoiled child." He got his revenge by excessive demands and controlled the parents by tantrums and bad behavior. Later, he, too, pretended affection and became more subtle in his revenge.

He was unfortunate. He failed in college. When he abandoned a trusting girl, the parents believed he had been victimized by an adventuress. They started him in business. He failed. The experiment was repeated. Again he failed. In the end, he involved a score of associates in his "losses." The family fortune was dissipated. And when at last the old folks died, Mr. C. became a burden on the state.

### Love Helps

A little love becomes a saving grace in such situations. Dr. Hadley tells of another man born as the third child into an impoverished family where his earliest memories were of hunger and parental discord. Peace came only after a full meal and that was seldom. Yet amid all his recollections of unhappiness, poverty, insecurity and bickering, he remembers that his parents would many times go hungry themselves to provide him with some scavenged bit of food.

This boy resolved that some day his parents would have all they wished to eat. He worked hard and prospered. He had no hate for the rich; they provided the odd jobs that were his stepping stones. He became successful and happy and never failed to provide food and comfort for the parents and all those who appealed to him for aid.

Business men are all too familiar with the grown-up spoiled child who must have what he wants when he wants it and who has gone all through life crushing anyone and everyone who has stood as an obstacle in his path, without the



### NOT SO NEW, AFTER ALL

*The highway center-line seems to be something new, invented especially for the benefit of this automotive age. But wait—here is a centuries-old highway between Mexico City and Cuernavaca, with a line of light-colored stones laid accurately along its middle, to divide it into two even halves. Were there traffic disputes in those old days, too?*

slightest appreciation of the havoc he has wrought—the tyrannical tycoon.

Dr. Hadley tells of another type of aggressive person who has so long sat on the lid of his own boiling hates that he has made himself see the antagonism only in others. He feels that he is discriminated against; that he is persecuted. He carries a chip on his shoulder. He may picture himself as a martyr and suffer long. Or he may be goaded into quarrels, the breaking of valuable business contacts, or even to expensive litigation.

It is the unrecognized antagonisms in business men that boil to the surface in a battle against government intervention in business. They hate paternalism in government for a very good psychological reason. Vigorous attempts to defeat taxes and promote laissez-faire are their expression of a deeply seated grouch, dating back to the days when their own parents "dictated" to them.

Business hates government because its ranks contain many a son of a stern father who once disciplined him without mercy.

Political reformers in the government may rage at "economic royalists," "Wall Street," "international bankers," and the "pirates of industry," because they nurse in their souls a need for revenge against early thwartings at the hands of a repulsing mother. They still long for Utopia where maternal affection would be abundant.

Agitators revile both government and business because in youth they suffered at the hands of both parents and early learned the technique of playing off one against the other for their own personal advantage. Such a personality exploits the weaknesses of either side, in league with the opposition.

The economic welfare of the nation totters under the buffeting from all these hidden hates.

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Science News Letter, May 13, 1939

## ● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association resulted in the location of the following four preliminary epicenters:

**Monday, May 1, 9:58.5 a. m., Japan time**

Off the west coast of Japan, in Japan Sea. Latitude approximately 40 degrees north, longitude 139 degrees east.

**Tuesday, May 2, 5:14.8 a. m., PST**

In Gulf of California, near Lower California coast. Latitude 29.5 degrees north, longitude 113.8 degrees west.

**Saturday, May 6, 1:00 a. m., EST**

In Pacific ocean, about 340 miles southwest of Panama City. Latitude 29.5 degrees north, longitude 84 degrees west.

**Sunday, May 7, 10:47 p. m., EST**

Eastern side of Azores islands, on Atlantic ridge. Latitude 37 degrees north, longitude 20 degrees west.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL August 13, 1938.



## PSYCHOLOGY

# Dull Babies Made Normal by Feeble-Minded Girls' Care

Increase of as Much as 40 Points in IQ Reported For Orphanage Children Transferred to Loving Care

A FANTASTIC experiment of taking 13 mentally retarded babies away from an orphanage and putting them into wards with feeble-minded young women, to make them normal, was revealed as a success by Dr. Harold M. Skeels, psychologist of the Iowa Board of Control of State Institutions, and Dr. Harold B. Dye, Superintendent of the Institution for Feeble-Minded Children of Glenwood, Iowa.

The fortunate 13, who seemed fated to spend life in institutions, have made such mental strides that seven are now adopted as normal children, and all but one of the 13 are now rated normal in intelligence, the experimenters reported to the American Association on Mental Deficiency.

Drs. Skeels and Dye attribute the rise in intelligence quotient, which in some cases was over 40 points, to the following advantages which the small children enjoyed as house guests of matrons and feeble-minded young women: a wealth of play materials, space and supervision for play, varied experiences, and much love and affection.

The psychologist and physician reported that the orphanage from which these children came has made "radical changes" in care of pre-school children, because, while the dull 13 improved, 12 other children in the orphanage, mostly rated normal, were found to be drifting back toward feeble-mindedness. The condition, which implies a warning to orphan asylums, was ascribed to overcrowded cottages in which the children received medical and physical care, but

were "mentally emaciated" for want of adult affection and stimulation.

A close bond of love and affection between a child and one or two adults appears to be very important for a child's development, the experimenters concluded. They emphasized that the backward children who blossomed in the

## PSYCHOLOGY

# The Animosity of Wasps Is Inherited From Queens

IF YOU lived on a farm when you were small, you probably were an interested spectator at the familiar battles between warlike wasps at the attic window or under the roof of the shed.

If you were brave enough and curious enough to put a worker wasp on the nest of a different species, you discovered that a vicious battle to the death was likely to ensue.

The worker wasp will tolerate or even fraternize with a strange worker of the same species, but is as antagonistic to foreign species as are some of the human species of Central Europe.

These wasp battles have been put on a scientific footing by Dr. Phil Rau, of Kirkwood, Missouri, who has watched them in orphan colonies in his laboratory and also has watched the wild insects in sheds and old buildings.

"Animosity" in wasps at least is instinctive and runs in the family, Dr. Rau said in a report to the *Journal of Comparative Psychology*. Although you may have thought so all along, it has not been nearly so clear to scientists, because of the fact that the worker wasps who do the fighting for the colony never can hand on any traits to the next wasp generation. The workers never have young—that is reserved for the queen.

Observing the queen at battle is a difficult task. But the queen, when she is unable to delegate the battle to work-

care of matrons and feeble-minded foster-mothers might have improved even more, if given better facilities.

The experiment began, they explained, as the result of "startling preliminary findings" when two children rated as pathetic imbeciles, were transferred to a school for feeble-minded and chanced to be placed in adult care where they began to develop amazingly and became normal. Mothers of both these children were mentally deficient.

Drs. Skeels and Dye described the experiment as a psychological prescription. They called the result an "added challenge" in educating feeble-minded children whose backwardness is functional and not caused by brain defects or organic disease.

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ers, is quite capable of putting up a vigorous fight on her own behalf. She is unfriendly to all alien queens, although she is not necessarily friendly to all queens of her own species.

Workers come by their belligerency honestly, Dr. Rau concludes, by inheritance from their queen mother. From her they also inherit their ability to make nests, make pulp, hunt caterpillars, and the many other complicated instinctive activities of wasp life. The queen does all these things herself in the early days of colony founding.

The workers do not learn to be belligerent by imitation of the queen mother, for Dr. Rau's fighting workers in his laboratory were orphans, raised from the larval state in window frames where they never saw their original colony.

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Color blindness is rated about ten times as prevalent in men as in women.

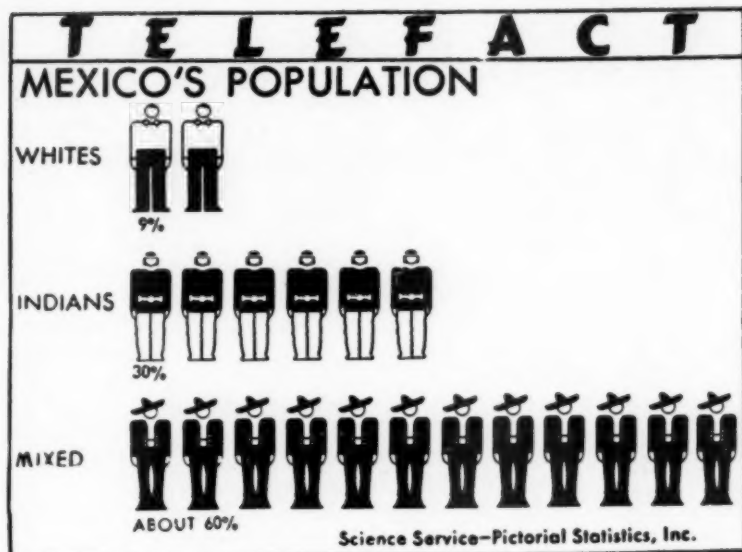
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## RADIO

Dr. Vincenzo Petruccio, national consultant on archaeological research projects, Works Progress Administration, will be the guest scientist on "Adventures in Science" with Watson Davis, director of Science Service over the coast to coast network of the Columbia Broadcasting System. Monday, May 22, 5:45 EDST, 4:45 EST, 3:45 CST, 2:45 MST, 1:45 PST. Listen in on your local station. Listen in each Monday.



## PHYSIOLOGY

## Vitamin for All Life Found And Partially Synthesized

ONE vitamin out of the whole alphabet of them is probably essential for the growth of all living things, from bacteria, fungi, seed plants and similar lowly forms to the higher animals and possibly man himself.

Two new discoveries which indicate that there probably is such a universal vitamin appear in technical reports to the *Journal of the American Chemical Society*. At the same time partial synthesis of the vitamin is reported.

The vitamin is part of the large group of B vitamins, which include the anti-beriberi vitamin, thiamin, the anti-pellagra vitamin, nicotinic acid, and riboflavin. The universal vitamin is called pantothenic acid, its Greek name indicating that it is found everywhere. This vitamin was first discovered by Prof. R. J. Williams (brother of Dr. R. R. Williams, who synthesized another vitamin, B<sub>1</sub> or thiamin) and associates at the University of Oregon, who found that it stimulates the growth of yeast.

The latest discoveries, indicating that this vitamin promotes growth of chicks, are reported by two groups of experimenters, Dr. Thomas H. Jukes of the University of California and Drs. D. W. Woolley, Harry A. Waisman and C. A. Elvehjem of the University of Wisconsin. Dr. Elvehjem is the chemist whose studies of nicotinic acid led to its becoming the cure for pellagra.

Dr. Jukes reports that a preparation of pantothenic acid (calcium pantothenate) protected chicks from a dermatitis which develops when they are on a diet lacking in part of the vitamin B group called the filtrate factor. Dr. Elvehjem and associates report partial synthesis of this filtrate factor which their chemical studies show is very similar to pantothenic acid.

"Final proof of the identity of the two," they state, "must await crystallization of the pure compound."

The discoveries are probably important in connection with man's nutrition, even though chicks are the experimental animals on whom these discoveries have been made. Prof. Williams, discoverer of the universal vitamin, pantothenic acid, points out in a statement to Science Service.

From his new post as professor of chemistry at the University of Texas he sent the following explanation of the significance of the discoveries:

"Since its discovery it (pantothenic acid) has been found to be not only present in widely different tissues and organisms but to function as a potent physiological substance stimulating the growth of yeasts, molds, lactic acid bacteria, diphtheria bacillus, protozoa, young alfalfa seedlings and liverworts, and to stimulate the respiration of various tissues.

"The present discovery of Jukes and of Woolley, Waisman and Elvehjem is the first one linking it up definitely as a 'growth promoting substance' for higher animals, though it has been recognized as a constituent of all types of animal tissue and to be stored in the livers of all animals.

"Too great significance should not be placed upon the fact that chicks are the experimental animals used in these first experiments. There is evidence that the same substance is required by pigs and dogs and the inference is not a wild one that it is necessary for the nutrition of all of the higher forms of animal life and that it makes up an essential part of every living cell.

"One of the interesting features regarding this discovery is that it demonstrates anew the kinship of the whole organic world, since the lowly microscopic yeast cell requires for its nutrition the same substance as is required by higher animals. Pantothenic acid is produced by various molds and microorganisms in the soil and elsewhere and by green plants after they develop their photosynthetic apparatus.

"Not all of the vitamins seem to be as universal in their function as pantothenic acid. Yeast which is typical of the lower plant life apparently does not contain vitamin A, vitamin D, vitamin E or vitamin C, unless especial means are taken (such as irradiation with ultraviolet light) to place them there. It seems probable that these vitamins may not be essential to all forms of life. Vitamin B<sub>1</sub> and nicotinamide, on the other hand, like pantothenic acid, are probably universally present in living matter."

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#### PSYCHIATRY

## Do Well-Baby Clinics Lead To Adult Industrial War?

**B**ABY clinics and pamphlets on infant care have reduced the toll in child lives.

Perhaps it has had another far-reaching effect never dreamed of by the physicians and nurses who have contributed so greatly to child health.

Personality is formed in the nursery. Feeding schedules, rocking, cleanliness and cuddling, all have their effects in the making of the future man.

The baby who is fed by the clock rather than in answer to his own hunger pangs, who is trained to be clean, to do without sucking his thumb, to go to sleep alone in his crib instead of in the comfort of mother's arms will turn out to be a very different individual from the baby who is never forced into a schedule, never nagged nor neglected.

Typical of the middle and upper classes is the careful book-training of infants, points out Lawrence K. Frank, of the Josiah Macy, Jr., Foundation in the journal, *Psychiatry*. Typical of the poor is the easy-going feed-him-when-he-cries, let-him-suck-his-thumb method.

Frustration leads to aggression. Children of the middle class, emerging from an infancy of nagging and "training", have conflicting emotions about authority. They have been taught to submit to rules, yet have learned to resent them. They are likely to grow up self-seeking, ambitious, perhaps rebellious.

Children of the easy-going parents are themselves likely to be submissive, content, unaggressive.

"It is significant," says Mr. Frank, "that the leaders of social life come so often from the middle group."

But now the middle class methods of child rearing are being rapidly extended to the poor through well-baby clinics, pamphlets, lectures and visiting nurses.

Lower class mothers are getting jobs and leaving their babies to professional care. Early weaning, less cuddling and mothering, fixed routines, and neurotic anxiety over baby's health are becoming the order of the day in all the homes.

Can this be a factor in the spread of industrial strife?

Science News Letter, May 13, 1939

A young woman 25 years old directs the Moscow Circuit railway.

Eagles repair and enlarge their nests from year to year.

Fruit of the hurricane plant ripens so slowly that eating a single fruit is a process of several days.

#### PHYSICS

## Thunder and Lightning To Be Made at World's Fair

See Front Cover

**T**HE APPARATUS illustrated on the front cover of this week's SCIENCE NEWS LETTER resembles some fantastic giant musical instrument, but thunder is the lusty music it roars forth. Towering upward for 34 feet, these are banks of capacitors for the 10,000,000-volt artificial lightning generator which will give New York World's Fair visitors their first experience of man-made thunder and lightning. The apparatus will be exhibited in Steinmetz Hall, shown by the General Electric Company.

Science News Letter, May 13, 1939

### ● Microfilm Documents

SCHEUNERT, A. and WOLFANGER, L.: The influence of various amounts of vitamin A requirement (translated by Adolph Losick)—*Hoppe-Seyler's Zeitschrift für Physiologische Chemie*, Band 252, Heft 1-2, 1938. Document 1166. 13 pp. 33 c.

SETINSKI, VICTOR: My drainage principles and the law of Darcy (translated by Ross Leamer)—*Bodenkundliche Forschungen*, Band 4, Nr. 3, 1935. Document 1167. 77 pp. 97 c.

DANNECKER, DR.: Production control in forests managed for timber production (translated by G. Radke)—*Deutschen Forstwirtschaft*, Nr. 81-83. 1929. Document 1168. 38 pp. 58 c.

CORRENS, ANNA-EVA: Determination of the vitamin C content of human and cow's milk during the summer (translated by S. T. Ballenger)—*Klinische Wochenschrift*, Jahrg. 16, Nr. 3, 1937. Document 1169. 14 pp. 34 c.

STOLZE, ERICH: The colorimetric determination of sodium in plant ashes (translated by W. B. Rankin)—*Bodenkunde und Pflanzenernährung*, Band 8, 53, Heft 3/4, 1938. Document 1170. 20 pp. 40 c.

RINNE, LEO: Seeds Mixtures for cultivated meadows on low moor (translated by R. L. Lovvorn)—*Fourth International Grassland Congress Report*, 1937. Document 1171. 15 pp. 35 c.



# Announcing

## Medical Advisory Committee

DR. WALTER C. ALVAREZ

Professor of Medicine, University of Minnesota. Mayo Foundation; Senior Consultant, Division of Medicine, Mayo Clinic; Editor, "American Journal of Digestive Diseases."

DR. ANTON J. CARLSON

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DR. MARION B. SULZBERGER

Assistant Professor of Clinical Dermatology and Syphilology, New York Post-Graduate Medical School, Columbia University; Editor, "Journal of Investigative Dermatology."

## CONSUMERS UNION'S new MEDICAL SECTION

Starting with this month's issue, a new Medical Section will appear regularly each month in *Consumers Union Reports*. It will contain authoritative medical reports on foods, drugs and cosmetics; articles on medical news and questions of public health; and pertinent information on hygiene and health.

This new department will be published under the supervision of Dr. Harold Aaron, author of "Our Common Ailment" and Special Medical Adviser to Consumers Union, with the advice and assistance of the distinguished Medical Advisory Committee listed at the left.

The new department starts with reports on—

### HEADACHE REMEDIES

—of types which may provide the relief they are taken for but may also lead to addiction and to serious disability.

### ANTISEPTICS

Another report, on antiseptics and mouthwashes, attempts to provide better information about these widely promoted products than that offered by advertising fantasy.

## MEN'S SHOES

Elsewhere in the magazine you will find a detailed report on men's shoes with ratings of 16 brands. Two \$4 shoes top the list while five others ranging from \$2.98 to \$6.75 are considered poor values at the price. An early issue will carry a report with ratings on women's shoes.

## FACE CREAMS and POWDERS

There's little difference in quality between various brands but an astonishing difference in cost—2800% in the case of the cheapest and most expensive brands of cold creams rated. 85 brands of creams and face powders are covered in these reports. Packaging practices in the face powder field constitute one of the frankest cheats in the marketplace.

## GARDENING

Besides the fun in gardening, there are also excellent fresh vegetables and fine flowers to be had—provided you know which brands of seeds and fertilizers to buy, what kind of soil is best for what kind of vegetables, etc. This report gives you a few simple hints and some ratings of supplies. More paper packets of seeds than you think contain incredibly poor stuff.

JUST MAIL the coupon below to get this issue. The yearly subscription fee also entitles you—without extra charge—to the 1939 BUYING GUIDE, a 288-page handbook containing ratings of over 2000 products to be published in May.

To: CONSUMERS UNION of U. S. Inc.  
17 Union Square W, New York, N. Y.

Send me CONSUMERS UNION REPORTS for one year and the 1939 BUYING GUIDE when it appears. I enclose \$3. I agree to keep confidential all material sent to me which is so designated.

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# •First Glances at New Books

## Exploration

**LIFE ON AN ICE FLOE**—Ivan Papanin—*Messner*, 300 p., \$2.50. This is an English translation of Ivan Papanin's diary, an epic account of one of the most important explorations of modern times. Indications of the mass of data of scientific interest gathered by Papanin and his three companions throughout their drift on an ice floe during the long Polar night and the beginning of the Polar day are scattered through this simply written document.

*Science News Letter, May 13, 1939*

## Electrical Engineering

**THE DISEASES OF ELECTRICAL MACHINERY**—G. W. Stubbings—*Chemical Pub. Co.*, 219 p., \$3. A textbook for the electrician, apprentice and power plant engineer on what goes wrong with electrical machinery, why, and how to rectify it.

*Science News Letter, May 13, 1939*

## Psychology

**CAST OUT YOUR DEVILS**—Alfred M. Uhler—*Stackpole*, 302 p., \$2. A popular book intended to aid the layman to achieve mental health and happiness. The author is an associate of David Seabury, also a popular writer on psychology.

*Science News Letter, May 13, 1939*

## Psychiatry

**OUTLINE OF PSYCHIATRIC CASE-STUDY**—Paul W. Preu—*Hoeber*, 140 p., \$1.85. Intended as a manual for psychiatry students, this book is very informative and should be valuable to physicians, guidance officers and all those who deal with mental adjustment problems.

*Science News Letter, May 13, 1939*

## Sociology

**METROPOLIS, A STUDY OF URBAN COMMUNITIES**—Howard Woolston—*Appleton-Century*, 325 p., \$2.75. A study of the city from many angles—political, social, psychological. The book is intended as a text for students of sociology, but undoubtedly has a much broader field of interest. The author is professor of sociology at the University of Washington.

*Science News Letter, May 13, 1939*

## Physics

**THE DECLINE OF MECHANISM (IN MODERN PHYSICS)**—A. d'Abro—*Van Nostrand*, 982 p., \$10. The historical development of physical theories is reviewed from their beginnings to the modern quantum theory, with emphasis on Heisenberg's Principle of Uncertainty and on reasons for abandoning mechanical interpretations for thinking

in physics. Background is provided in mathematics, in natural philosophy and in physics itself.

*Science News Letter, May 13, 1939*

## Photography

**THE MINIATURE CAMERA IN PROFESSIONAL HANDS**—Remie Lohse—*Studio*, 119 p., \$1.50. This book proves that the miniature camera can produce photographs containing as delicate gradations as are found in photographs made with larger cameras, but with the spark of spontaneousness added.

*Science News Letter, May 13, 1939*

## History

**DRAKE'S PLATE OF BRASS AUTHENTICATED**—Colin G. Fink and E. P. Polushkin—*California Historical Society*, 28 p., illus., cloth, \$2.75; paper, \$2. See SNL, May 6, page 279.

*Science News Letter, May 13, 1939*

## Medicine

**MEDICAL VOCABULARY**—English, German, French, Italian and Spanish—Joseph S. F. Marie—*Blackiston's*, 358 p., \$3. Useful to those who may have to address a foreign audience on medical matters or, as in case of war, to communicate with non-English-speaking doctors or nurses. The book translates from English to the other languages, but does not give the English for foreign terms.

*Science News Letter, May 13, 1939*

## Biography—Bacteriology

**WIDE ROAD AHEAD, The Story of a Woman Bacteriologist**—Anne B. Fisher—*Dutton*, 276 p., \$2.50. Those who like medically flavored novels will doubtless enjoy this one.

*Science News Letter, May 13, 1939*

## Aeronautics

**THE STORY OF AIRCRAFT**—Chelsea Fraser—*Crowell*, 515 p., \$2.50. A revised and up-to-date edition of one of the standard popular works on the history of aviation.

*Science News Letter, May 13, 1939*

## Engineering

**ENGINEERING'S PART IN THE DEVELOPMENT OF CIVILIZATION**—Dugald C. Jackson—*Amer. Soc. Mech. Eng.*, 114 p., \$1.55. The text of six lectures by Prof. Jackson of the Massachusetts Institute of Technology, delivered a little more than a year ago at the University of North Carolina State College of Agriculture and Engineering. The role of engineering from earliest times to the present is surveyed. A preface is by George A. Stetson.

*Science News Letter, May 13, 1939*

## Physics

**INTRODUCTION TO CONTEMPORARY PHYSICS**—Karl K. Darrow—*Van Nostrand*, 648 p., \$7. Dr. Darrow has now revised his well-known book. The growth of physics in 13 short years is astounding. Dr. Darrow covers new developments: Electron diffraction, the discovery of neutrons, positrons, mesotrons, artificial radioactivity and the new nuclear physics.

*Science News Letter, May 13, 1939*

## Botany

**PLANTS OF IOWA** (5th ed. of the Grinnell Flora)—Henry S. Conard—*Published by author*, 95 p., 50 c. The vascular plants found in Iowa "keyed out" for the convenience of botanists. This small but highly workable manual, designed originally for use at Grinnell College, has been expanded in response to a general demand in its region.

*Science News Letter, May 13, 1939*

## Mathematics

**ELEMENTARY MATRICES, AND SOME APPLICATIONS TO DYNAMICS AND DIFFERENTIAL EQUATIONS**—R. A. Frazer, W. J. Duncan, and A. R. Collar—*Cambridge*, 416 p., \$8.50. This volume develops the subject with special reference to its application to differential equations and classical mechanics. No previous knowledge of matrices is assumed.

*Science News Letter, May 13, 1939*

## Psychology

**THE PSYCHOLOGY OF MAKING LIFE INTERESTING**—Wendell White—*Macmillan*, 215 p., \$2.50. Dr. White, who teaches psychology at the University of Minnesota, believes that variety is truly the spice that makes life interesting. He urges variety by adopting new hobbies, by changing your clothes, moving the furniture around, making new friends and by seeking solitude for a change—even by avoiding monotony in your speech.

*Science News Letter, May 13, 1939*

## Psychology

**IT'S NICE TO KNOW PEOPLE LIKE YOU**—Harry Walker Hepner—*Appleton*, 172 p., \$1.50. This book is intended to help college students and business employees to develop social skills. The author, who is on the staff of the vocational psychometric laboratory of Syracuse University, hopes to overcome your shyness by telling you what to talk about to strangers, how to give compliments and how to put other people at ease.

*Science News Letter, May 13, 1939*